391 — 7/10 long. head thorax, legs & first joint of
July 1 the antennæ yellow red — rest of the joints & black & spectinated
1818. shells crow black broadest near the tips —

#391 to 461

No. 4

Coll. 133

Notebook #4

392. Carabus- somewhat rather more than 4/10 long head, & antens
thorax & legs pale reddish yellow. eyes black. shells. greenish-
July 1. and broad & the tail
1818.

393. color. dark brown — antennae of a lighter brown
~~thorax bostled &~~ marked with 2 yellow band across ~~the thorax~~ of a silky lustre
July 2 shells with each four irregular formed bands across them — of
1818 the same color & lustre — legs pale red yellow. — with
the same yellow silky color about the eyes & face found on
the sumach flowers. —

394 & 4 first joints of the antens
long — head thorax & legs a clove brown
or rather black brown — the heads of the rest of the joints
July 3 of the antens are black brown the other part or half paleish clo.
1818. shells taper very much towards the tips and are of an umber
yellow dull. and minutely warted or pustulated —

395 Coccinella. $\frac{11/2}{10}$ long. brown black with 6 orange spots margin of the thorax and head pale yellow. — found on the milk weed.

July 2 1818.

396. Cetonia? $\frac{6}{10}$ long. of a glossy appearance grass green a passing into pale brown on the exterior margin of the shells. Thorax — legs reddish yellow. tarsi black brown. — found on the blossoms of the Sumach — —

Bronzed Cetonia

397.

long — general color of a dark or purple brown — figured with pale markings ~~toward~~ the shoulder with a whitish spot on each shell near suture and a stage from it to the outer margin — the tips of the shell are marked with whitish lunules — the ~~thorax~~ shell tapers very little from the shoulder — the thorax, which is rounded & wrinkled & punctured — has a ~~white~~ yellowish spot near at the base near each ~~shoulder~~. shoulder — the head is sunk in the thorax —

July 3. 1818.

398.

long ~~the general color of~~ this insect is of a salmon yellow or of a reddish yellow. with dark brown eyes — found on ~~the~~ the alder —

July 2. 1818.

399. July 3 1848

$\frac{4}{10}$ long. Is the same as the Scarabaeus subspinosus. which inhabits it is thought exclusively the rose in the flowers of which it causes great destruction — The specie here figured were found this day in great numbers on the flowers of the Rhoeadae (Rhus ——) the only difference in the sexes perceivable appear to be in their size the female being $\frac{4}{10}$ long & the male about 3/4. in some specimens the thorax is marked with 2 longitudinal fine dark lines the abdomen of both is thick or rounded — and the tarsi are dark & remarkably long — the general color of the insect is of a yellowish or dirty buff thighs & half of the shanks of a yellowish red — the shells are marked with a brown a little down or next to the suture

number in coitu this day.

400. 1¼ inch long — of a pea green color with a pale whitish yellow lateral band. with faint fine lines down the back of the same yellowish white color. & minute whitish dots particularly towards the head. on the back of the 3 annulations from the vent there are 4 small black raised spots and on the first annulation next the head. there is a row of 4 small black spots and 4 smaller in the rear of those — found on the full blown rose eating the leaves

July 5 1848.

402. Cirnea

vandyke brown
marbles on the head
July 5
1818. of the shells dark

fresh blood red.
~~Scarlet or crimson~~ (purple) or dark brown ~~the plate back of the thorax~~ with dark brown
& purple
& along the sutures & towards the end
brown
found on the mullen

antennae & legs

Humulus Lupulus or Common Hop.

403

June 30
1818.
last of them
July 9.

Papilio of the hop vine — undergoes the change
this day — they are rapid in their growth & moultings
and not more than 20 days from their being first hatched
to the pupa state. the pupa has a remarkable, roman
nose-like prominence on the upper part in front and two thick
points (projecting) on the top. along down on the underpart
there is a double row of points they are generally of a
brown but they are of various shades & colors in different speci-
mens being in some of a greenish tint or color of a wilted or decayed
leaf in others — have all more or less of a flesh color; a dirtish which varies from
pale to a high flesh color. about the head. with a row on
each side towards the under part of & slightly polished silver spots
in some specimens these spots look like the fresh broken pyrites
in others of the color of Dutch metal or copper gold
the pupa is near 1 inch long — the suspend themselves in
some private or obscure place when they undergo the change
in about 15 days the butterfly comes forth — which is
of an orange red in the superior wings
very elegantly marked with thick purple brown spots
the lower wings like the upper are deeply emarginated
and of a orbital brown the tails are small & short — both
lower & upper wings have a very narrow outside margin of a
pale sky or whitish blue — the tips of the extended
superior wings are 2 1/2 inches apart —

404
same as
No.
July 5
1818
very
common

Papilio of the Milk weed. underwent change from the larva to the pupa this day — at first appears of a pale ~~yellow~~ apple green - at the base of the wings is a golden narrow band ~~bordered with a black line~~ extending half round the pupa with 6 golden × spots on each side of the thorax with 6 golden spots. 24 hours ~~day or two~~ before. they undergo the change they spin a few threads (—) and fasten themselves ~~at the anus~~ the head bent up (—) (appear. to be sick). suspend themselves. ~~not stretched out~~ (somewhat like a hook)

× the ~~thorax~~ the gold color is not seen at first but by degrees the fine yellow improves to burnished gold.
~~the~~ foot stalk is black with a black spot near it
on the ~~upper~~ back & six black spots on the under side.

405
very
common

Papilio of the thistle — there are a beautiful butterfly though very common undergoes the change into a chrysalis this day.

July 6
1818.

July 13.
came out
this day.

July 11
two went into Chrysalis.

July. 20
both came out

406

July 6 1818

$\frac{1\frac{1}{3}}{10}$ long / a grey color: marked on the shells with a broad black brown zig zag band ~~toward~~ the tips with dark spots / placed ~~transverse~~ from the shoulders to the suture antennae dark brown & nearly 2 ~~times~~ the length of the insect

407

cimex

rather more than $\frac{2\frac{1}{2}}{10}$ long — burnt umber brown — body pale — / an high flesh color on the edges with 3 tits ~~on~~ down the middle of the back the two lower ones divided. or ~~two~~ ~~tootted~~ — the fore thighs round, ~~thicky~~ knobbed, ~~tootted~~ — found on the garden Raspberry.

408 Cimex. $\frac{3}{10}$ long of an orange yellow, ends of the
July 8 wings transparent black. Legs & antennæ olive brown —
1818.

409. Cimex $\frac{3}{10}$. broad & flat pale brown, pale yellow
on the thorax on each side next the head. eyes small &
June 10 brown antenæ pale or ~~omi~~ rose red. legs pale. body
1818 on the back ~~va~~ varied with red streaks on each side with
minute dark brown dots on the legs. head thorax plate & wing cases.
found on the fruit of the raspberry —

410

Silpha Astra.

July 10 1818

Silpha. $\frac{27}{10}$ long; head & antenæ black brown. under side of the end of antenæ pale thoran pale citron yellow shells rough or furrowed or mottled black brown. with a black star on the middle general form of the insect flat. shell flexible with a broad margin the under side of the margin of the shell of a brassy greenish color & lustre; margin of the thoran very broad —

411

July 11 1818

Asilus 1 inch long clove brown eyes red brown under the neck face with long dun colored hair — body marked with 3. lateral white spots last joint of the body or two tufts of silver white hairs laying flat — upper side of the tarsi of the fore feet pale ochre yellow. ends? of the feet tufts legs + tarsi spiny —

412. Cocinella. $\frac{2\frac{1}{2}}{10}$ long. head black marked with two white lengthened dots in front. thorax white with a black. black a mark. or ornament. or figure difficult to be described —
July 12 1818 shells of a deep yellow ochre color smooth uniform color. — and a narrow whitish margin legs pale yellow — found on the leaves of the beet —

it is rather more than 1 inch in length —

413. Hummingbird Sphinx. This is the most beautiful of the
July 13 1818 — species of the in form & color tribe in the US. The upper view of the insect presents the head & thorax covered with green hair. the first and second annulations of the body of a flesh color. the 3 & 4 of a brilliant lake brown — & the two last of a green color in the middle of which is the brown color of the two preceding annulations. the body is terminated by a divided tuft of red & black hairs — The middle part of both the upper & lower wings is transparent & the exterior nerve is broad & brown and the exterior margin of all the wings having having a broad band of the richest vandyck brown — it flies in the day & from its rapid motion, its form, & color. is with difficulty distinguished from a small humming bird when on the wing — which it further resembles in the rapidity of its motion and stationes * alternately changes from a rapid to a stationary movement on the under side the breast thighs & thanks are white. wings marked with a red brown exterior band running up. next the body. the body has 4 lateral small white tufts on each side — antennae black brown ——— it sucks the honey of flowers like the humming bird & and like it in its food being the nectar of flowers which it extracts with its long spiral tongue

414 $\frac{3\frac{1}{2}}{10}$ long ~~pale~~ grass green eyes yellow with brown lines
form broad at the head. and triangular in front. thorax
black. dotted with white found on the current bush
July 14 1818 No 415 is supposed the larva.

415 $\frac{3}{10}$ $\frac{\frac{1}{2}}{10}$ long pale grass green. armed from
the head down along the back with a double row of
July 14 1818 tits from which proceed spines ~~on~~ a pale brown the spine a smaller lateral
ones. the end of the body is stim & turns up — possibly
the larva of 414 as they were both found on the currant
bush the same day.

416
July 15
1818.

larva of Sphinx — about 3 inches long.
found on the Cucumber vine the general color of this
worm is of a yellowish green or the color of the
cucumber leaf — it is marked on the back with 18 irregular
formed oval rings with pale yellow spots in the
with in the rings the color is pale yellow. or
cane color. and on the side next the each opposite spot
or ring is a dash of deep flesh color — On each annulation
of the body there is a lateral small black figure in the
middle of which there is a small rose colored oval spot —
a dash of yellow is placed just below each figure beneath
which is a fine black line. near 1/8 of an inch long —
about the head & point it is marked with minute whitish dots
the under part in pale yellowish feet & supporters —
larva of this insect has a black broad band down the
inner side of each row of the yellow spots; these bands
are studded with minute yellow spots the female
male. or other sex feeds on the sorrel —

July 20 changed to a pupa Aug 20 came out
the pupa is 2 inches in length — has no probosis which
is at first of a pale
mulatto yellow afterwards becomes browner darker yellowish. just before is a
few days before the butterfly emerges it appears the markings of the superior wings
are distinctly seen — it remains in the pupa state 4 weeks. —
it flies in the dusk of the evening. about flowers with great velocity
hovering over them — it is seen hovering about flowers usually in the dusk
of evening — The sphinx is very beautiful the upper wings are of
a dark olive with a broad inner border of a lead or pale bluish color.
and broad band of a yellowish color stretching from the tip of the wing down to the root
the nerves white and apparently raised. the under wings are of a bright rose color. with a broad black
border all round it body has.

417
July 16
1818.
The larva is 1 3/4 inch long — is of a
green or yellow green color. round the middle of each
annulation paper or black band. deeply notched in on
the upper side or that next the head, the notches in the
black band. are filled up with a pale yellow color; the annulations
are very distinctly marked by a black line between each —
false foot or supporter — when the period of its
transformation arrives, it suspends itself by a
July 18? 19? couple of threads tied round the middle or near the head and
gradually drawing itself together in two or three days it
undergoing the change — two days. state during the most complete after some time these
colors are a surprising change of form & color. ✱ In this
dirty
of an earthy yellow streaked with black brown — ✱ In this state
it remains for from 18 days or 3 weeks in the pupa state
✱ Then this change takes place without
the insect throwing off the exuvia or old skin two prominent
projects from the head. and the green changes to a whitish green
with a fine maple or whitish yellow tint on the back. the pupa
is 1 1/2 inch long —

418 larva of. 1 1/10 long. This insect or worm is white and has a row of black tufts in the form of a + down the middle of the back with a short black dash or hyphen like stroke on each side between each joint with a double row of black lateral dots — head glossy jet black. feet & false feet and body of a bister brown — covered on the back & sides with white hairs —

Aug 16 1818.

419. { is from 2 to 2 1/4 inches from tip to tip of the upper wings } White wings ridged when at rest edged black feelers black short 1 1/4 inch long. outer nerve of superior wing has 5 black spots placed nearly equidistant commencing at the shoulder with a few black dots. on the upper surface none on the under side the under wings have two black spots on the upper surface one in the middle, the other near the inner edge at the base with corresponding black marks on the under side and also a black spot near the root of the wing. — the back of the insect has a broad orange yellow band. commencing just below the root of the wings & reaching to within 1/4 of the end. on on 5 annulations in the center of each there is a black spot. and another black spot on the annulation next adjoining these. — the abdomen is white with 6 rows of black dots the outer or lateral ones are composed of 6 dots each. the under next rows composed of 4 dots each & the middle of 2 small ones. the anus is bare. the joints next the body and thighs of the fore legs is orange as are the forepart of the thighs of the middle legs the knees of all are black; the joints of the tarsi alternate black indistinctly — the black spots in the wings are not always alike; in different specimens (being more numerous) in some the upper surface of the inferior wings has 3 large spots; and the outer or bases edges of both upper & lower wings has a row of black dots the form of the superior wings is more oval at the outer end not so square as 324 by which it is easily distinguished when the spots are rubbed off —

aug 17 1818

420.

aug 17 1818:

Larva of ——— Bonaparte. 3 inches long this is a superb insect in the larva state - being of a yellowish white green or leek on the back of the annulations next the head - it has 4 red crowns or balls studded with black points and next to these 2 yellow ones. with 12 yellow tit like protuberances or two on each annulation ~~then is terminated~~ the anteperiniate ~~is~~ very has a yellow. crown or ball. on the back of it ~~this one~~ it has a double row of lateral similar tit like protuberances of a pale sky blue color and between these is a row of oval pale blue spots — feet & supporters of a yellowish green — it feeds on the hazle & filbert but I know not whether it prefers it as food. there. it was found on a dead rose bush adventitious very sluggish in its movements and a slow feeder — when full grown it extended it is near 4 inches long and of the thickness of a swan's quill. it is 2 or 3 days before it finishes its cocoon from the time it commences this is composed of an external cover like a bladder partly inflated — in this is situated the silken cone directly covering the pupa. the silk when first spun is nearly white but in a day or two it changes to a salmon color. and gradually becomes of a brown — the silk is coarse & very strong and might prove valuable experiments ought to be instituted & trials made as it is hardy insect & would not require the care nor subject to accidents of the common silk worm.

aug 31. 1818 spun in Sept 2 finished external coat of cocoon

Sept. 15 change into Chrysalis. complete

found Sept 1. 1818 on the rose

421.

aug 18 1818.

Larva of 2 to 2 1/4 inches long This is of a pale yellowish green color. paler on the back. with a red & white lateral band or stripe — the feet & supporters reddish brown. down the back there are 4 rows of pointed protuberances each of which are set round with pale yellow green bristles or having the appearance of being cut square off of equal length — with lateral similar but smaller armed protuberances below the stripe — the whole has a very delicate appearance — the spines of this worm cause a very painful sensation when the insect is incautiously handled; equally & similar in feeling to the nettle — if rubbed on the back of the hand draws a blister in a few minutes — feeds on the lombardy poplar. At one time in (date) this harmless insect had in Phila. nearly been the cause of nearly extirpating on the graceful poplar which adds so much to the beauty of our cities the introduction of which we owe to that public spirited individual the late Hamilton Esq? The excitement which existed at that period is hardly credible and the articles in the public prints are now scarcely credible — The thing was finally met in the proper way by ridicule and the poplars saved — feeds on domestic cherry

nettle worm

422 Larva of. from 1, 3/4 to near 2 inches long. of a yellowish brownish color
covered with tufts of long hairs of the same color.
Aug 19. belly naked of a dark lead color. or blackish — mouth pale
1818. yellow — feeds on the leaves of snow ball, water mellon leaves

423 3 inches between the tips of the wings of a pale cinnamon
or brownish flesh color.
brown with ~~two transverse~~ two dark lines parallel to the base of the
July 22 upper wings and two dark lines across the upper wings near the root with
" 23 a brown dot also near the center of the upper wings; the under wings
have two dark lines and each has a brown shaded band next to the
the margin of the ~~upper~~ & lower wings is deeply emarginated,
and the inner margin of the upper wing peculiarly curved — it
was found under the eves of a portico 17 miles from Philada on
the old Lancaster Road by Mrs Elliotts Inn — the eyes breast &
fore legs dark brown —

424

Larva of.

from 1 3/4 ~~1 1/8~~ to near 2 inches long — pale yellow green

with 6 rows of orange spots. between which are ~~dark~~ broad velvet black markings ~~on~~; the segments have

Aug 22 1818. each a round black spot on the side of the feet; and two smaller ones next the body. the front of the head or face is marked with 3 black dots with two black lines connected above when full size it has a double row of black points along the back and when smaller appears nearly black with a broad white band or spot across the middle of its back (——) when a fly or other insect comes the distance of an inch or 1 1/2 inch it shows manifest symptoms of dislike (it twitches itself on one side then on the other and protrudes its 2 orange colored snail like feelers) found on the parsnip which grows wild along the fences on the flats. on which it feeds. being found of all sizes or ages often on the same plants it eats not only the leaves & stalk but appears to be particularly partial to the unripe seeds. they are not a constant eater remaining for a long time in the same attitude generally with the head upper part raised and the head bent under — eat only at long intervals It is sometimes found nearly all of a velvety black with narrow yellow streaks between the divisions of the annulations and orange or deep yellow spots * this is supposed to be the effect of sickness or accidental starvation or want of a full supply of proper food ——

* the green color disappears. the black bands become broader. the yellow spots become smaller & round. — this change is supposed to be the effect of sickness. or it is not peculiar to them in any stage being found of this black appearance of all sizes ——

426

Aug 23 1818.

This larva of sphinx? found on the spirea grape.
1½ inch long with a ~~long~~ horn ~~at~~ on the end. Its
a flesh color ~~ex. pale~~ with a dirty greenish line runni from
the horn along upper part side each and eight transverse short
lateral greenish lines below the line with a small red spot between
each line. the lower or belly part is somewhat greenish the whole
of the insect is covered over with very minute pale flesh colored
dots -

427.

Aug 24 1818

Asilus This species is of a yellowish red
on the back of the body with 4 yellow lateral spots shaded
with dark red brown — face and balancers gamboge yellow
legs brown. — the shanks and tarsi with black brown
spines — thorax with a double line down the middle and
4 lengthen spots

asili prey
on smaller
insects
the hawk among
insects —

428. small Caty did or locust somewhat larger than the summer chirpers or fine singers which is found on timothy & grass

Aug 24 1818 this inhabits leaves of trees — all over green wings longer than the body. chirpers. with two whitish marks down the belly. anus pale yellow

brown — found in the wood on trees —

length including wings 1.7/10 male has head & body smaller than the female but the wings are rather longer. they are both of a sage green color the wings very delicately veined — the body of both is rather of a blueish green. the annulations marked with red. edges of the the upper part of the eyes is both brown the lower half pale green with a minute black pupil. the ovipositor of the female is of a yellow is broad flat, & recurved. short and of a yellow brownish or rather pale chocolate color. terra di sienna brown as are the tarsi of the feet — the jaws are black brown, down each side of the belly it has a flesh colored band becoming broader & darker as it joins the wings — the head of both is smaller than that of the summer chirpers — the feelers are not longer than the wings —

429 larva of Sphinx — between 3 and 4 inches long. This is the largest of the larva of Sphinx known in the United States. It is found on the

Aug 24 1818 is of a pale green with 8 lateral oval rings on each side in the center of each of which is a black opal spot the horn is pale purple black. it has lateral transverse short whitish yellow band shaded on the upper side with dark green

went in to Pupa Aug 31. The annulations are ribbed or have furrowes running round them the mouth & real feet are black — the pupa is comparatively short, thick, and dark red brown, with a long proboscis

430

found in the woods Aug 26 1818.
whole length 2 1/2 inches.

head & thorax ~~body~~ 1/2 inch long; abdomen 2 inches and composed of 5 long joints and one very short joint — of a pitch ~~and~~ (highly glossy) black — antennae 8/10 long 1/10 of an inch is of a pale flesh or buff. the hind shanks are very ~~thick~~ swelled —

432 rather more than 2/10 long found on Alder bush. —
long — black thick chunked insect with 4 large white
Aug 25 spots ½ on each shell antennae thin long joint ½ equal thickness
1878 antennae as long as the insect — head sunk in the
thorax —

1. 5/10 ". to 1 7/10 ".

433 larva of Papilio of the hops 1½ inch long, has 6
rows of points set round with spines of a yellow red color
general color of a pale light red yellow with a lateral row
of small black dots supporting a head red brown they
vary however greatly in color. — minutely dotted with white

found in the larva state in the month of June July & Aug.

434

aug 31
1818

supposed female of the singing locust. dark cane colored eyes. bluish green body. pale yellow brown shanks. and ab half of the thighs next the shanks swell of the hind thigh yellowish. antennae nearly twice the length of the head large in proportion to its size — note of the male sounds like tit tit tit, which the 3 first in rapid succession the last protracted

apiformis

435.

aug 31
1818.

male & female of the horse fly about the size of the common honey bee which it much resembles in form and color. being of a yellowish brown or yellow brown color. face opal milky dun color. eyes brown wings pale. and pale clouded across near the tips — with two small clouded dots at the tips — body & thorax hairy — body of the female tapering & ending extended and turned up under the abdomen — male terminates like a bee. legs pale — a double brown dot between the eyes upper part of the head & the female darker — the female deposits her eggs on the wing. in depositing her eggs she does not alight on the horse but deposits them on the wing hovers about the animal. its body nearly in an upright position its extended abdomen often brought forward or curved up. ♀ male rather more than 5/10 long. female 7/10 long —

436

Sep 1. 1818.

$\frac{3}{10}$ lon larva of found on the leaf of the chesnut tree this is of a pale bright green with two yellow ridges or raised bands. with a pale brown dot in front. with 3 rows of pale oval spots down the back transversely placed with a pale colored spot in the center of each oval spot. towards the extremity or margin it is translucent and is on the whole a very delicate & beautiful insect worm. it is of an oval form raised like a tortoise on the back. the head is inflected & deeply sunk in the body underneath — nothing can exceed the brilliancy of the green particularly between the two yellow bands.

437.

Sep 1. 1818

larva? or perfect insect this is about 3 or $\frac{3}{11}$ lg found on the wild cotton: probably Error ~~larva of Leucarpia Forster~~ of a burnt umber brown with a yellow streak down the middle of the abdomen — with yellow nape band on the neck. the first and 4th annulation of the body orange or salmon yellow the 2 3, 5, 6 7 & 8 annulets have each two triangular orange colored spots on the back of them — with a lateral bunches of spines on the annulation —— it is furnished with jaws —

Sep. 11 1818 changed to Coccinella.

This specier of Coccinella of which the above is the larva I think is of a somewhat elongated form; the color of the thorax and shells is pale lake or pink it has 2 large spots on the thorax connected together like the letter H and ten broad spots on the elytra two of which are equally divided by the suture. it is $\frac{2}{10}$ lg

1438

Sept 1. 1818

Cicada Pini (Cist) annual? 1 7/10 long in color the varieties & markings of the Philadelphia Locust but is not ~~much~~ more than 2/3 its size ~~it~~ like it it has the black brown green and fawn colored marks on the thorax the eyes are purple brown 3 minute ruby like stemmata the rib of the wing is narrow & green but the veins are darker and stronger marked than those of the Phila underneath it has much of the white chalky appearance about the belly abdomen face & sides of the body — it comes I think later not have I heard them before the middle of August in Leizen its note is very fine & faint compared to the Phila which last has a loud shrill & lengthened rattle. the note of this is ~~chi-chi-chir~~ ~~the two first notes in quick succession the last note lengthened for a considerable time~~ I have met with it only on the pitch pine or yellow pine even where the greatest variety of timber abounded — the two plates which cover part of the abdomen in the male are scarcely half the size of those of the Phila Locust nor do they lap ~~over~~ one over the other as in the case of the Phila. and in general the colors are not so clear or bright the thighs being of a muddier brownish green its note is like consists of a ~~fine long~~ continued long drawn ~~tcheke~~ grad. rising & ~~grad~~ ostrum louder dying away —

This species resembles ~~much~~

Phila is there as early as the 15 July. or earlier.

as gradually

439

Tobacco Worm

Aug 30
1818

The difference between 429 & this appears to be in the color of the horn which in this is pale sky blue with minute black dots towards the end. the 9 oval lateral spots are of an orange color. the head is more inflected real fine green in other respects it resembles 429 in color & marks is not above 3 inches long ? in Virginia where the Tobacco grows larger it ~~may~~ increases in size —

440

7/10 long

441. Spider. head & jaws black. thorax upper side silver grey. or pale lead color. ~~body black.~~ body or upper side of the abdomen velvet black with 2 irregular figured broad ~~kings~~ yellow bands and

Sep 6 1818 4 small spots 6 hinder ~~thighs~~ pale red ~~red~~ brown & transparent knees, joints next the body ~~the~~ fore legs & all the shanks & dark. and slightly hairy — underside marked with a yellow dash between the joints of the legs. and two yellow notes of Exclamation on the underside of the abdomen. — It spins a vertical web near the ground between low growing bushes & preys on flies &c — the yellow color is uncommonly brilliant ~~king~~ Gellow. —

442

446

(the young brood.

larva of. ——— found in clusters on the tree oak leaves. when shook off they fall suspended by a

Sep 8 1818 thread of silk — they are more rare than 140. the full grown caterpillar is near 2 inches long: when full grown they adhere very slightly to the leaves dropping off when the limb is slightly touched — the caterpillar has a yellow red head and on the hind support annulation a raised yellow red broad band with a knob or raised on the top — it has two lemon yellow bands or lines down the back — with another on each side of the same color. the intermediate spaces between these bands is of a pale dove or lilaceous color on which run interrupted black lines the whole length of the worm — when young fewer of the black lines appear & the animal is more of a greenish yellow except the bands. which are of a bright lemon color ——— head in the drawing too small being when young proportionately remarkable for the large flat head placed on like the head of a cane — they will live without food for 10 or 15 days — and yet appear lively —

447

length between the upper wings from tip to tip

~~1 inches to~~ 2 inches to 2 1/4. supper wings upper surface velvet black
Aug 28th with buff colored broad lines crossing each other under side black
with pure ochre yellow bands. (corresponding to the) the principal bands of the upper side.
upper side of lower inferior wings vermillion red passing into ochre
yellow next the superior upper wings — with large black somewhat heart shaped
spots along the base. underside ochre yellow. with a slight tinge
of vermillion next the body and black spots corresponding to the
upper surface. thorax buff. with three long black spots or lines
abdomen body black with two broad lines on the back of a vermillion color
composed of spots nearly square on each annulations except the two last
legs, eyes black —

448

canonading Carabus 5/10 long antennae, feelers head thorax
and legs reddish yellow — eyes black or black brown
Sep 10 shells longish blue or violet black broad shallow channelled. abdomen thick
1818. and rounded and longer than the shells thorax long
heart shaped & truncated next to the shells. This little
insect has the singular power when caught of producing small
little explosions accompanied by a small smoke like vapour and differs from
the kluine sprite-kafer or carabus. It is the female that has this
canonading power —

caterpillar

449. One inch long. ^ Black. very glossy annulation wrinkled
with 10. rounds, citron yellow raised lateral spots ^ with
Sep 10 6 real black feet. and 12 pale sky blue suppoters exclusive
1818. of the two at the vent — found in numbers on the
Willows in Sintons yard. it eats the leaves of the
willow leaving only the principal or middle nerve. rendering
them very unsightly. —

450. Bee $\frac{7}{10}$ found on Wild flowers in the meadows & wood.

Sep 12 1818. black. except the thorax which is covered with pale muddy yellow hairs with similar colored hairs covering half the back next the thorax — with a broad pale red brown band. in the midst of it reaching from one side to the other it has a sting —

451.

Sep 12. 1818

$\frac{6\frac{1}{2}}{10}$ long Bee found on wild flower meadow mill Creek head circular. flat face eyes very large thorax breast legs. and base of annulation with back with dirty muddy yellow hairs — 4 abdominal annulations covered with long brushy pale red brown hairs

There is another species not above 2/3 the above. lips hairy about the thorax hair paler and of a more silky crochet hairs and pale dirty yellow brushes on the abdomen — found at the same time & place —

There is another with very pale or whitish feet which I could not catch

There is another with a red body. could not catch —

452.

Sep. 14 1818.

Coccinella $\frac{3}{10}$ long shells orange yellow. with 9 black spots the spot just below the shell hinge divided by the suture the edge of the shells next the thorax white — the suture & margin of shells black lined thorax in front broad pale cane colored — after parts black; back of the head eyes. black. lip & jaw feelers. abdomen & legs blackish found on a fence —

453. Wasp near 1 inch long has a long Crow black
base joint of the antennæ black rest of it pale yellow or
orange with a transparent reddish yellow large spot near
Sep 15 the tip of the upper wing rest of the wing dark brown & glossy
1818 found on wild flowers at Mill Creek meadow
the spurs at the end of the shanks are very short

454. Cimex ½ inch long or 5/10 black brown Face grey
with a large (orange) or full Chromic Yellow after death spot covering
Sep 15 one half of the upper side of the abdomen next the thorax
1818 found in my garden

455 Spider from the fore toe to hind 3 inches long
body thorax & abdomen $\frac{8}{10}$ long. thought to spin no web
light brown. with dark brown streaks & marks on thorax & abdomen
thighs marked with dark brown interrupted lines legs annulated
Sep 17 1818 with brown rings — thighs & legs with a few spines — found
on boards ——

456 Galeruca 12. Punctata. $\frac{2\frac{1}{2}}{10}$ long thorax & elytra rather a
dirty pale yellow. color. with 12 black brown pretty large spots; head
black brown — the 8 last joints of the antennae black brown.
Sep. 18. or olive brown — 3 first joints very pale yellowish — half the thighs near
1818 to the body also pale yellowish the other half of the thighs and
all the shanks & tarsi olive black —

457. Warp... 8/10 long — antennae half the length of the insect all over black except 2 orange red spots joined together on the upper part of the abdomen on the 2nd annulation next the thorax — found on flowers wings brown black..; the spurs at the end of the thanks are long — thanks and first joint of the tarsi spiny

Aug. 20 to 1818.

458 Galerucea ? This is of rather a smaller size & longer slimmer form than cucumeris, head and abdomen black brown — thighs and the middle & hind thanks pale. is of a lighter color & nearly transparent fore thanks & all the tarsi dark brown knees black brown or biter brown. three first joints of antennae pale tipt with black — rest black brown shells pale dove color. or ash grey marked with three black longitudinal biter black bands or stripes similar to cucumeris — found chiefly in the fall of the year — often just beneath the surface of the ground. or earth — thorax pale lemon yellow with two brown dots or spots in the center ——— the female I think is somewhat larger and more swelled. they are not numerous. like cucumeris —

Sep. 28 to 1818.

Moths Phalaenae the larvae of these are found
at this season in great numbers seeking some dark
Sep 28. 1818 hole or corner. where they may spin undisturbed & undergo
the change into the chrysalis state they are of all colours
from a perfect white, & the various shades of yellow. red & brown
to a full black with shorter or longer hair & more or less hairy
species — this hair did not becomes useless when they undergo
the change it state serves them for defence in this new state
it is spun in with the silk & together forms a strong protection
from the various species of insects which are insectivorous.
how admirable does God Nature provide for the meanest of his creatures
even the crawling worm is not neglected ——

Sep 23 1818 The Caty did which for. about a week has been silent
or not been heard. and which for 6 weeks had been
only heard from their posts here & there a solitary one
were this day observed in the middle of the day in
found 25 Sep. 1818 a dead female only one I have ever seen — great numbers all through the woods. making an
incessant noise with their wings — heretofore they were
only heard at night is this a different specie? what does
this mean they were only heard this day not one the
next day & subsequently — I caught some they appeared pale
colored an apparently had not been long in the perfect state
the female are few in number I have met with the blacks 1 to 20
perhaps owing to their make no noise they are not so easily found & that may
to their color the males would be equally rare if their note did not lead to their discovery.

Sep 30 The Pine Cicada is yet heard though rather scarcer
at no season of the year are they ever so numerous as the
Phila [illegible] Septendecim

July 26 1818 a white pine 27

459. This insect was taken out of the shutter of Doct Means house in the larva state where it had been 15 years. the shutter covered with a thick coat of paint it had been often of late years heard in the larva state and when dug out had it is presumed not long before undergone the change. the jaws internae legs abdomen and thorax are of a very dark brown the first joint of the antennae large & knobbed at the end as are the rest with the exception of the 4 last which are somewhat flattened, the thighs are remarkably broad towards the knees and flattened. the feet have all 3 joints besides the claw joint the joint next the claw joint is bilobate — the shells are flexile transparent pale brown darker at the apex or tips — punctured or rough with two narrow very pale longitudinal nerves on each elytron — the abdomen is flattened beneath toward the vent and gradually tapers or is drawn out to a point. on the top of the thorax at some distance apart are two raised burnished spots — face covered with a pale yellow down. ~~round which is scattered about the thorax and its margin~~ under side edges of the thighs shanks tarsi & thorax with a cinereous hair or down — insect 7/10 of an inch long — wings iridescent —

460 The Bramin this insect is an inhabitant of the middle or southern States and is the largest species of Horse fly in the U.S. or perhaps of the world — thorax legs of a pale brown abdomen very dark brown with the lower edge of the annulations of the July & August. abdomen marked with a fine pale line — head or rather the eyes which are large and somewhat of a triangular form dark chatoyant under the head, under side of fore part & sides of the thorax together with the thighs covered with pale cinereous brown down or hairs — horses become very restive when one of these insects hovers or flies about them —

467 Hazlewood.

See Barton's Medical and Physical Journal 1804 Part I Vol I. page 119

Pl. Falconera

6th Section viz Finca

Finca Granitica? or allied to it.

Nepa —

Water Scorpion

*Great strength

This is one of the largest & most formidable insects in the United States. Admirably formed by nature for the element in which he lives, encased in a horny coat of mail & possessing powers of strength ten times his own bulk he hesitates not to attack an animal more than twice his own size. Like the Tyger of the Desert or the Panther of the Jungles he lays in wait concealed amid grass &c for his prey. & springs on it as soon as it comes in reach of his fore legs clasped round the body & his single hooked claw deep inserted in the skin it is in vain for the affrighted animal to attempt to escape — with his (horny) sharp pointed proboscis he penetrates to the skin deep in the vitals of his prey after vain attempts to disengage himself from his adversary to his blood & soon falls an unresisting sacrifice to his assailant. — Though resembling the tyger in the fierceness of his attacks & destroying many & contenting himself with sucking the blood or vital juices of his prey —

large figure — green — Leaf-Cricket

Cricket or a pale colored insect

This Insect is long exclusive of the abdomen with 2 green stripes down the back of a pale yellow ~~green~~ color: the green very pale approach to olive

It has brown marks on the thorax & about the legs and sides of the abdomen — " — —

The wings are so pale a green as to be almost colorless — the shells are remarkably nerved & finely reticulated — standing a beautiful subject under the glass

This insect is heard in our garden about the middle of August. and is remarkable for its note which is that of high shrill a rattle — it is frequently may be known by its note and thus traced but will have to be carefully looked for on account of the paleness of its color; and being generally on the under side of a leaf: (the sound produced by the male resembles that produced by blowing into a key — small by blowing into a key — similar to that produced by blowing into a key —

3 Species

House or Domestic Cricket — Domestica

Field Cricket — Campestris

Leaf Cricket — Acheta Arbustorum

The Bees -

At the approach of night the bees seek a shelter
in some bell shaped flower (holy Oak) where
neatly among its farinacea down & sheltered by its petals
& he reposes in precisely Hyde free
breathing from its fragrant purple
under its splendid canopy
from the cares & perplexities attendant the great
the slumber of the great
under a

& the sun is shedding
and the morning is light in the heavens before the sluggard awakes

Fire fly —

These insects make their appearance early in July.
and their number is astonishing

The garden appears studded with their yellow light
with a thousand floating fairy lamps
sparkling in every direction.
every tree & bush seems is illuminated

The appearance is truly beautiful

The manner in which this species constructs his nest
differs from most others

for this purpose he attaches some band in the vicinity
and tears off with his jaws a great quantity of their slivers
he proceeds to make them together in little bundles
he then walks very deliberately to the end nearest the place
of the nest he rakes with his forepaws each bundle under him & forces it
he proceeds in this manner moving each bundle as with a rake
as far as he can under him — & then again walks back to
and pressing and wheels round
and pursues the same course with each bundle until he
brings the whole to the nest

Latin term for Plaister mason or (mud wall) builder

Caementarius
Crustarius

Mason Wasps

These insects appear to me ought to form a distinct genus their habits form are different from the other Vespa the abdomen is short thick & rounded in front and attached by a long cord to the metathorax and they build their nests of mud or clay

among the generalities of the oeconomy of this genus noted. I have occasionally met with small caterpillars substituted the place of the spider Query is it necessary that the food of the larva should be some insect that produces silk. in order to enable the larva to produce silk around itself — the quantity of the spider put in is just sufficient for the support as it appears whenever any spiders are found that the egg never was hatched or that the worm perished prematurely — when full grown they spin a cocoon & render it within as polished as glass — the pieces are

after describing the insects habits the oeconomy &

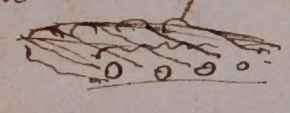
its nest is composed of a double rows of parallel mud-built chambers placed in the two rows, lying the manner of those of a cartouch box. these chambers are not more than 1 inch in length and 3/8 of an inch in diameter in its widest place becoming smaller towards each end where it is rounded or crowned the chambers are generally from 10 to 16 in number — and are not lined with a gold beater like or bladder like case being the cocoon of the larva covering the larva like most others of the species — the nest too is rarely or more irregularly built than most of the other species. the chambers run at right angles with the front line of the nest

they build in dark places as always under shelter as some out house garret or dark corner — Who taught them that the nests must be built under shelter & frost without which the rain would soon wash or dissolve their building? * compared with the size the weight of its nest or the quantity of wood necessary for the little animal to raise is truly astonishing, sometimes exceeding 300 times its own weight! this is done too with considerable expedition say days — according to the size from 3 4 to 8 or 10 spiders are put in by the parent. calculated to support the young in the larva state —

* who also taught them to build in retired dark places for the security of the young? as it must be that object alone the thick mud walls which they erect already make placing their young in the darkness of the grave

B Mr. Spence describe its form size oeconomy habits &c

The nest is composed of only one row of chambers which are generally from 4 to 5 in number the mud walling being rather higher in front & sloping back. these chambers are somewhat longer than those of the last being 1 1/8 inch long but not more than 2/8 in their widest part; they are not placed at right angles with the front line of the doors but generally incline much to the left



1 1/8 of an inch long

V This specie describe form ✕ ✕ ✕

The nest of this specie is generally composed of three mud chamber in one row but placed so as to form somethg like a Trapezium or a rhomb; the skin invelloping the nidus or worm being externally slightly covered with silk —

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V This specie the one in the window of my chamber — describe it ✕

This specie like the rest builds its nest in dark corner places — describe its form —

It is interesting to observe it in its operation of building its nest after having found a suitable place and [illegible] made she disappears in search of mud — in a few [illegible] with round a ball of soft mud in the jaws here [illegible] by a buzzing noise the ball is now applied [illegible] dexterously spread with her mouth in [illegible] another so as to form the cell. the buzz[illegible] during the work stopping as soon as don[illegible] she flies off for another ball. working [illegible] until the cell is completed — (she now plais along with it several spiders. she plasters over the whole covering the [illegible] is composed and the tracks of her [illegible] another cell which is finished in the [illegible] partner not assisting in the [illegible] of her toils sporting on the [illegible] or dozing at a distance on [illegible] an example in the refined de[illegible] or apology who too indolent or proud suffer[illegible] his wife to obtain to all th[illegible]

see Vol 6 part 1. of American Philosophical Transactions for an acct of two species of Sphex inhabiting Virginia & Pennsylvania by B. H. Latrobe.

St Johns wort (Hypericum perforatum) not a native of the United States of Muhlenberg

vignette

This every object of creation
Can furnish hints for contemplation
And from the most minute & mean
A virtuous mind may morals glean Gay..

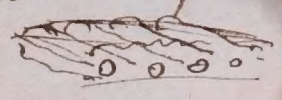
American Entomology

the Egyptians ... astonishing, 200 times in Europe. have taken a particular interest in this study.

* expedition say ... Montesquieu ... Collection of the Dutchess of Portland ... admiral Boscawen ... a pair is by the parent ... the wife of ... * who also taught Madame Merian ... who to the science of an entomologist ... of the young ? ... accomplished artist made a journey to Surinam South America ... which they erect ... & represent ... the insects of that region. Here ... grave ... a splendid memorial of these talents — but it is to ... her too often been said to

B ... species ...

The nest is composed ... from 4 to 5 in number ... & sloping ... back. these ... begin ... first ... & but not more than 2/8 ... placed at right angles with the ... incline much to the left



1 4/8 of an inch long

or